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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

FEELY, MICHAEL J

ART UNIT

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1796

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/581,928	Applicant(s) SHIBAYAMA ET AL.	
	Examiner Michael J. Feely	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20080616, 20070509, 20060607</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Pending Claims

Claims 1-12 are pending.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-8 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Akaho et al. (WO 03/066741 A1).

US 2005/0107497 A1 is the US and English-language equivalent for this WIPO document, and it has been relied upon as a translation document. Accordingly, all citations are directed to the US publication.

Regarding claims 1-8 and 12, Akaho et al. disclose: *(I)* a thermosetting resin composition (Abstract; paragraph 0029) characterized as containing an epoxy resin (paragraphs 0051-0063) having an epoxy equivalent weight of 100 - 2,000 (paragraphs 0051-0063; Example

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2), an epoxy hardener in the form of a compound having a phenol group (paragraphs 0064, 0072), and a layered silicate in the amount of 0.2 - 100 parts by weight, based on 100 parts by weight of resin constituents including said epoxy resin and epoxy hardener (paragraphs 0088, 0107-0108, 0119);

(2) characterized in that said epoxy resin contains at least one type selected from the group consisting of a bisphenol epoxy resin, biphenyl epoxy resin, dicyclopentadiene epoxy resin and naphthalene epoxy resin (paragraphs 0051-0063);

(3) characterized in that said epoxy hardener comprises at least one type selected from the group consisting of hydrophobic phenol compounds represented by the following formulas (1) - (3) (*see claim for structure details*): (paragraph 0072);

(4) characterized in that said layered silicate comprises at least one type selected from the group consisting of montmorillonite, hectorite, swelling mica and vermiculite (paragraphs 0088, 0107-0108, 0119);

(5) characterized in that said layered silicate contains at least one type of ammonium salt selected from the group consisting of alkyl ammonium salt containing 6 or more carbon atoms, aromatic quaternary ammonium salt and heterocyclic quaternary ammonium salt (paragraphs 0094-0097);

(6) a resin sheet characterized as comprising the thermosetting resin composition as recited in any one of claims 1-5 (Abstract; paragraph 0029); (7) a resin sheet characterized in that it is obtained by curing the resin sheet as recited in claim 6 (Abstract; paragraph 0029; Examples); (8) characterized in that a part or all of said layered silicate is dispersed in the form of a stack consisting of 5 or less layers and has a mean interlayer spacing of at least 3 nm along

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the (001) plane when measured by a wide-angle X-ray diffraction method (paragraphs 0088, 0107-0108, 0119); and **(12)** a resin sheet for insulating substrate, characterized as comprising the resin sheet as recited in claim 6 (Abstract; paragraph 0029; Examples).

4. Claims 1-8 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Yonezawa et al. (WO 02/46312 A1).

5. Claims 1-8 and 12 are rejected under 35 U.S.C. 102(a) as being anticipated by Yonezawa et al. (US 2004/0053061 A1).

US 2004/0053061 A1 is the US and English-language equivalent for this WIPO document, and it has been relied upon as a translation document. Accordingly, all citations are directed to the US publication.

Regarding claims 1-8 and 12, Yonezawa et al. disclose: **(1)** a thermosetting resin composition (Abstract; paragraph 0010) characterized as containing an epoxy resin (paragraphs 0043-0055) having an epoxy equivalent weight of 100 - 2,000 (paragraphs 0043-0055; Examples 5-111), an epoxy hardener in the form of a compound having a phenol group (paragraphs 0056, 0064), and a layered silicate in the amount of 0.2 - 100 parts by weight, based on 100 parts by weight of resin constituents including said epoxy resin and epoxy hardener (paragraphs 0080, 0101-0102, 0111-0113);

(2) characterized in that said epoxy resin contains at least one type selected from the group consisting of a bisphenol epoxy resin, biphenyl epoxy resin, dicyclopentadiene epoxy resin and naphthalene epoxy resin (paragraphs 0043-0055);

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(3) characterized in that said epoxy hardener comprises at least one type selected from the group consisting of hydrophobic phenol compounds represented by the following formulas (1) - (3) (*see claim for structure details*): (paragraph 0064);

(4) characterized in that said layered silicate comprises at least one type selected from the group consisting of montmorillonite, hectorite, swelling mica and vermiculite (paragraphs 0080, 0101-0102, 0111-0113);

(5) characterized in that said layered silicate contains at least one type of ammonium salt selected from the group consisting of alkyl ammonium salt containing 6 or more carbon atoms, aromatic quaternary ammonium salt and heterocyclic quaternary ammonium salt (paragraphs 0087-0089);

(6) a resin sheet characterized as comprising the thermosetting resin composition as recited in any one of claims 1-5 (Abstract; paragraph 0010; Examples); **(7)** a resin sheet characterized in that it is obtained by curing the resin sheet as recited in claim 6 (Abstract; paragraph 0010; Examples); **(8)** characterized in that a part or all of said layered silicate is dispersed in the form of a stack consisting of 5 or less layers and has a mean interlayer spacing of at least 3 nm along the (001) plane when measured by a wide-angle X-ray diffraction method (paragraphs 0080, 0101-0102, 0111-0113); and **(12)** a resin sheet for insulating substrate, characterized as comprising the resin sheet as recited in claim 6 (Abstract; paragraph 0010; Examples).

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Claim Rejections - 35 USC § 102/103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 9-11 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Akaho et al. (WO 03/066741 A1) or Yonezawa et al. (WO 02/46312 A1).

8. Claims 9-11 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Yonezawa et al. (US 2004/0053061 A1).

Regarding claims 9 and 10, the teachings of Akaho et al. and Yonezawa et al. are as set forth above and incorporated herein. The references fail to explicitly disclose the following properties: **(9)** characterized in that it exhibits a mean linear expansion coefficient (α_1) of not exceeding $4.0 \times 10^{-5}/^{\circ}\text{C}$ over a temperature range that is 10-50 $^{\circ}\text{C}$ lower than a glass transition temperature of a cured product of said thermosetting resin composition; and **(10)** characterized in that it exhibits a mean linear expansion coefficient (α_2) of not exceeding $4.0 \times 10^{-5}/^{\circ}\text{C}$ over a temperature range that is 10-50 $^{\circ}\text{C}$ higher than a glass transition temperature of a cured product of said thermosetting resin composition.

Akaho et al. disclose overlapping ranges for these properties (*see paragraphs 0031-0036 of Akaho et al.*). Furthermore, both references satisfy all of the material/chemical limitations of the instant invention. In light of this, it has been found that, “Products of identical chemical composition can not have mutually exclusive properties.” A chemical composition and its

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properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present – *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Therefore, if not obviously disclosed by the prior art, then the instantly claimed properties would have been inherently satisfied by Akaho et al. and Yonezawa et al. because these references satisfy all of the material/chemical limitations of the instant invention.

Regarding claim 11, the references fail to explicitly disclose the following property: **(11)** characterized in that a cured product of said thermosetting resin composition exhibits a dielectric constant at 1 GHz of not exceeding 3.3 and a dielectric loss tangent at 1 GHz of not exceeding 0.015. However, it appears that this property would have been satisfied by these references because they satisfy all of the material/chemical limitations of the instant invention.

Therefore, if not obviously disclosed by the prior art, then the instantly claimed property would have been inherently satisfied by Akaho et al. and Yonezawa et al. because these references satisfy all of the material/chemical limitations of the instant invention.

Double Patenting

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

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A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the combined limitations of claims 1-14, 16, 17, 19-24, 31, and 32 of copending Application No. 10/503,490 (US 2005/0107497 A1). Although the conflicting claims are not identical, they are not patentably distinct from each other because:

There is significant overlap between the copending claims and the instant invention. Furthermore, the instantly claimed phenolic curing agent would have been obviously envisaged in light of the specification (*see paragraphs 0064, 0072 of the pre-publication*) – *See: In re Vogel*, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970); MPEP 804, II, B, 1. Furthermore, the instantly claimed properties would have been inherently satisfied.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

11. Claims 1-12 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over the combined limitations of claims 27, 28, 42, and 43 of copending Application No. 10/433,956 (US 2004/0053061 A1). Although the conflicting claims are not identical, they are not patentably distinct from each other because:

There is significant overlap between the copending claims and the instant invention. Furthermore, the instantly claimed phenolic curing agent (*see paragraphs 0056, 0064 of the pre-*

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publication) and the ammonium salt (*see paragraphs 0087-0089 of the pre-publication*) would have been obviously envisaged in light of the specification – *See: In re Vogel*, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970); MPEP 804, II, B, 1. Furthermore, the instantly claimed properties would have been inherently satisfied.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

International Search Report

12. The international search report cited two X-references. Both have been considered; however, the applied art (*see rejections above*) appears to more comprehensive, with respect to the instant invention.

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Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is (571)272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael J Feely/
Primary Examiner, Art Unit 1796

October 1, 2008